MULTI-STAGE DATA PROCESSING FOR FREQUENCY-SCANNING INTERFEROMETER

Abstract

A system of frequency-scanning interferometry uses a computer system operating in accordance with a program for measuring distances or range, including measuring topographical information about test object surfaces. Interferometric data is detected using a single point detector or an array of such detectors and recorded (stored) in the computer system, and a series of measurements are taken over a range of illumination frequencies. The interferometric data varies in a sinusoidal manner with a change in illumination frequency at interference frequencies corresponding to particular measures of distance or range. A Fourier transform for locating peak interference frequencies is first limited in frequency space and second divided into stages to save processing time. A coarse spacing between Fourier frequency samples is used for a first approximation, and finer spacing between Fourier frequency samples are used in the vicinity of the first approximation to make a second more accurate approximation.